|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 4 | 3 | 2 | 1 |
| Claim | Clearly states claim, correctly using vocabulary about the relationship between the distance of effort and amount of effort required to lift the load. | States relationship between the distance of effort and amount of effort required to lift the load.  Correctly uses most vocabulary. | Claim is incomplete, or does not answer the question. Uses little or incorrect vocabulary. | Incorrect or no claim present. |
| Evidence | Uses at least two pieces of data that support the claim with appropriate vocabulary. Each piece of data includes the distance of effort and amount of effort required with correct units. | Uses at least two pieces of data that support the claim and uses most vocabulary.  Each piece of data includes the distance of effort and amount of effort required, with missing or incorrect units. | Uses only one piece of data that supports the claim  OR - uses little or incorrect vocabulary  OR - Each piece of data includes the distance of effort and amount of effort required, with missing or incorrect units.  OR - Data sets may be incomplete. | Evidence is missing or incorrect. |
| Reasoning | Through the use of data, accurately explains the relationship between effort distance and the amount of effort required. Also offers how the opposite claim is not supported by the data. The correct vocabulary is used. | Uses data to explain the relationship between effort distance and the amount of effort required. Or describes how the opposites claim is not supported by the data. Uses some vocabulary. | Restates evidence and/or does not clearly explain the relationship between effort distance and amount of effort required.  Uses little or incorrect vocabulary. | Incorrect or missing reasoning. |

Investigation 4 *– Pulleys at Work*

Claim, Evidence, and Reasoning Rubric

Investigation 4 – *Part 1 and 2: Pulleys at Work*

Scientific Explanation

**Claim:** What is the relationship between the distance the effort moved and the amount of effort required to lift the load?

**Evidence:** Use the evidence collected (distance effort moved and amount of effort required) to support your claim.

**Reasoning:** Identify the relationship between distance moved and effort required.

**Exemplar Response (4):**

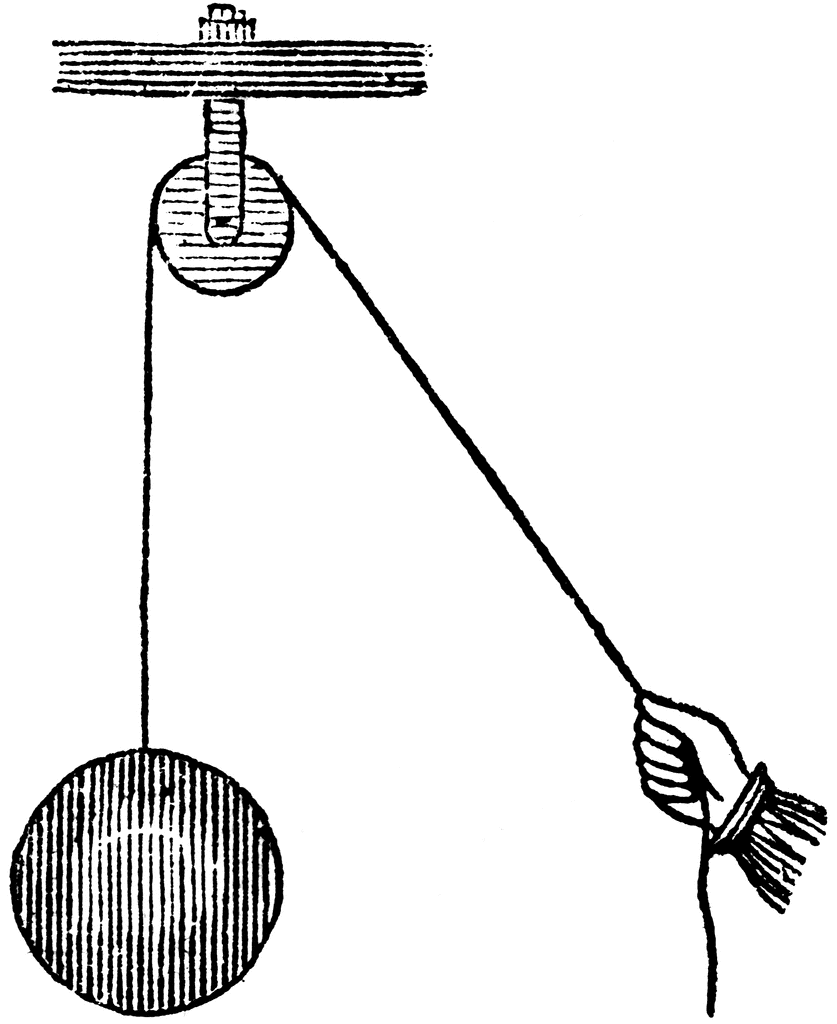
***Claim:*** As the effort moved a greater distance, the amount of effort required to lift the load decreased.

(OR)

As the effort moved a shorter distance, the amount of effort needed to lift the load increased.

***Evidence:*** When the effort moved 5cm, the amount of effort required to lift the load was 4.8N. When the effort moved 15cm, the amount of effort needed to lift the load decreased to 1.6N. (\*Newton measurements may vary *slightly* between groups)

***Reasoning:*** As the effort moved an additional 10cm (from 5cm to 15cm), the amount of effort needed to lift the load decreased by 3.2N. Another possible outcome could be that as you increase the distance of the effort that the effort would also increase. However, the data did not support this.

[](http://www.google.com/url?sa=i&rct=j&q=pulley%20clip%20art&source=images&cd=&cad=rja&docid=7hpAOpG8RT97oM&tbnid=J2jnUH4cJ9CY9M:&ved=0CAUQjRw&url=http://etc.usf.edu/clipart/35700/35786/pulley_35786.htm&ei=8Y8XUvTQJ8X9iwLGrIFo&bvm=bv.51156542,d.cGE&psig=AFQjCNFDknPl68EznOv4NcYEsLn45sDhMA&ust=1377362280885686)Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Period:\_\_\_\_\_\_\_\_

Claim, Evidence, Reasoning Template

Investigation 4: Pulleys at Work

|  |  |
| --- | --- |
| Claim:  ***What is the relationship between the distance the effort moved and the amount of effort required to lift the load?*** |  |
| Evidence:  ***Use the evidence collected (distance effort moved and amount of effort required) to support your claim.*** |  |
| Reasoning:  ***Identify the relationship between distance moved and effort required.*** |  |